WHAT IS CLAIMED IS:

1. A substantially pure O-Superfamily conopeptide selected from the peptides set forth in Table 2.

2. A substantially pure conotoxin peptide selected from the group consisting of the mature toxin peptide sequences disclosed in Table 1 except the peptides Di6.2, Af6.9, KK1, KK2, δ-GmVIA, M6.4, δ-PVIA, δ-PVIA-OH, δ-NgVIA, δ-TxVIA, and Israel TxVIA.

3. The substantially pure conotoxin peptide of claim 2, wherein Xaa_1 is Glu.

4. The substantially pure conotoxin peptide of claim 2, wherein Xaa_5 is Tyr.

5. The substantially pure conotoxin peptide of claim 2, wherein Xaa_4 is Trp.

6. The substantially pure conotoxin peptide of claim 2, wherein Xaa_2 is Gln.

7. The substantially pure conotoxin peptide of claim 2, wherein Xaa_3 is Pro.

8. The substantially pure conotoxin peptide of claim 2, wherein Xaa_3 is hydroxy-Pro.

9. The substantially pure conotoxin peptide of claim 2, wherein Xaa_5 is ^{125}I-Tyr, mono-iodoTyr or di-iodo-Tyr.

10. The substantially pure conotoxin peptide of claim 2, wherein Xaa_4 is 6-bromo-Trp.

11. The substantially pure conotoxin peptide of claim 2, wherein Xaa_1 is Gla.

12. The substantially pure conotoxin peptide of claim 2, wherein Xaa_2 is pyro-Glu.

13. An isolated nucleic acid comprising a nucleic acid coding for an O-Superfamily conotoxin precursor comprising an amino acid sequence selected from the group of amino acid sequences set forth in Table 1.

14. The nucleic acid of claim 13 wherein the nucleic acid comprises a nucleotide sequence selected from the group of nucleotide sequences set forth in Table 1 or their complements.

15. A substantially pure conotoxin protein precursor comprising an amino acid sequence selected from the group of amino acid sequences set forth in Table 1.

16. A pharmaceutical composition comprising a conotoxin peptide or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier, said conotoxin peptide being the conotoxin peptide of claim 1.

17. A pharmaceutical composition comprising a conotoxin peptide or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier, said conotoxin peptide selected from the group consisting of the conotoxin peptides of claim 2.

18. A method for regulating the flow of sodium through sodium channels in an individual in need thereof which comprises administering a therapeutically effective amount of a conotoxin peptide of claim 1 or a pharmaceutically acceptible salt thereof.

19. A method for treating or preventing disorders associated with voltage gated ion channel disorders in which comprises administering to a patient in need thereof a therapeutically effective amount of a conotoxin peptide of claim 1 or a pharmaceutically acceptible salt thereof.

20. The method of claim 18, wherein said individual in need thereof suffers from a disorder selected from the group consisting of multiple sclerosis, other demyelinating diseases (such as acute disseminated encephalomyelitis, optic neuromyelitis, adrenoleukodystrophy, acute transverse myelitis, progressive multifocal leukoencephalopathy), sub-acute sclerosing panencephalomyelitis (SSPE), metachromatic leukodystrophy, Pelizaeus-Merzbacher

disease, spinal cord injury, botulinum toxin poisoning, Huntington's chorea, compression and entrapment neurophathies (such as carpal tunnel syndrome, ulnar nerve palsy), cardiovascular disorders (such as cardiac arrhythmias, congestive heart failure), reactive gliosis, hyperglycemia, immunosuppression, cocaine addiction, cancer, cognitive dysfunction, disorders resulting from defects in neurotransmitter release (such as Eaton-Lambert syndrome), and reversal of the actions of curare and other neuromuscular blocking drugs.

21. The method of claim 19, wherein said disorder is a neurologic disorder.

22. The method of claim 19, wherein said neurologic disorder is a seizure.

23. The method of claim 22, wherein said seizure is seizure is associated with epilepsy.

24. The method of claim 21, wherein said neurologic disorder is a neurotoxic injury associated with conditions of hypoxia, anoxia or ischemia.

25. The method of claim 24, wherein said neurotoxic injury is associated with stroke, cerebrovascular accident, brain or spinal cord trauma, myocardial infarct, physical trauma, drownings, suffocation, perinatal asphyxia, or hypoglycemic events.

26. The method of claim 19, wherein said disorder is pain.

27. The method of claim 26, wherein said pain is migraine, acute pain, persistent pain, neuropathic pain or nociceptive pain.

28. The method of claim 19, wherein said disorder is inflammation.

29. The method of claim 19, wherein said disorder is a cardiovascular disorder.

30. A method of alleviating pain which comprises administering to a mammal that is either exhibiting pain or is about to be subjected to a pain-causing event a pain-alleviating amount

of an active agent comprising a conotoxin peptide of claim 1 or a pharmaceutically acceptible salt thereof.

31. A method for treating disorders associated with radical depolarization of excitable membranes by activating a K_{ATP} channel which comprises administering to an individual in need thereof an effective amount of an active agent comprising a conotoxin peptide of claim 1 or a pharmaceutically acceptible salt thereof.

32. The method of claim 31, wherein said disorder is cardiac ischemia.

33. The method of claim 31, wherein said disorder is cerebral ischemia.

34. The method of claim 31, wherein said disorder is asthma.

35. The method of claim 31, wherein said disorder is ocular ischemia.

36. A method of identifying compounds that mimic the therapeutic activity of a O-Superfamily conotoxin, comprising the steps of: (a) conducting a biological assay on a test compound to determine the therapeutic activity; and (b) comparing the results obtained from the biological assay of the test compound to the results obtained from the biological assay of a O-Superfamily conotoxin.

37. A substantially pure O-superfamily-conotoxin peptide derivative comprising a permutant of the peptide of claim 1.

38. A substantially pure O-superfamily-conotoxin peptide derivative comprising a permutant of the peptide of claim 2.